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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,504	12/26/2000	Junji Yoshida	6635-60104	6968
7590 04/20/2004 COUDERT BROTHERS 600 BEACH STREET San Francisco, CA 94109			EXAMINER LEUNG, QUYEN PHAN	
			ART UNIT 2828	PAPER NUMBER

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/750,504	YOSHIDA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Quyen P. Leung	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 1/21/2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19,32,36-38 and 40-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19,32,36-38 and 40-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Allowable Subject Matter*

1. In response to the 1/21/2004 amendment claim 29 has been canceled.
2. The indicated allowability of claims 1-19, 32, 36, 37-38, 40-43 is withdrawn in view of the newly discovered reference(s) to Hayakawa et al (4,916,708 and 4,894,836). Rejections based on the newly cited reference(s) follow.

Examiner regrets any inconvenience this caused to applicant.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5-9, 11-15, 17-19, 32, 37-38, 40-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayakawa et al (4,916,708). Hayakawa et al discloses the claimed invention. See figure 1 for the doped lower cladding (54), undoped spacer layer (80, which is apart of layer 72), undoped confinement layer (76 and 82, which are part of layer 72), active layer or light generating layer (70), upper optical confinement layer (74), a p-doped upper cladding

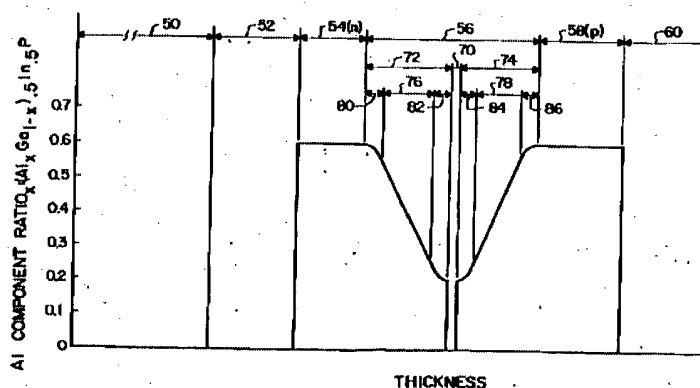


FIG. 1

Art Unit: 2828

layer (58). Regarding the thickness of the spacer layer (80) being less than that of the cladding layer (54), see col. 6 line 64 for the cladding layer (54) having a thickness of 1 micron and col. 7 line 15-35 for the thickness of layer (72) being 0.2 microns (200 nm) thick which implies that thickness of layer (80) is less than 0.2 microns and therefore less than that of the cladding layer (54).

Regarding the first and second electrodes, see col. 8 line 67 through col. 9 lines 2 for the claimed electrodes:

Although the drawing does not show details, to complete the semiconductor laser, plasma CVD is used to form a layer of  $\text{SiN}_x$  about 0.3 micrometer thick on the 65 p-GaAs layer, and a photolithographic process is then used to remove the  $\text{SiN}_x$  layer in strips 10 micrometers wide. On the p side, an ohmic electrode is then formed by the alloying deposition of AuZn/Au on the p-GaAs

9

layer 62. On n-side electrode of AuGe/Ni/Au is formed on the reverse side of the GaAs substrate.

Regarding the MOCVD, note col. 1 lines 5-14:

1

#### SEMICONDUCTOR LIGHT-EMITTING DEVICES

##### BACKGROUND OF THE INVENTION

###### 1. Field of the Invention

The present invention relates to semiconductor light-emitting devices such as semiconductor lasers and light-emitting diodes having a high emission efficiency. It particularly relates to semiconductor light-emitting devices having high-efficiency emission layers which 10 can be readily formed on a substrate of semiconductor mixed crystal using MBE (molecular beam epitaxy) or MOCVD (metal-organic chemical vapor deposition).

Regarding the optical confinement layer (76 and 82, which are part of layer 72) comprising a quaternary compound, see col. 7 lines 15-16 for the layer (72) comprising AlGaInP, see col. 9 lines 39-47 for the layer (272) comprising AlGaInAs. Note further col. 10 lines 30-50, for an alternative quaternary compound of GaInPAs.

According to figure 1, region (80) appears to be about 1/5 the thickness of layer (72), which would translate to one-fifth of 200nm, or 40 nm, so spacer layer (80) has a thickness greater than 4 nm, but less than that of the lower cladding.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa et al (4,916,708) in view of Hayakawa et al (4,894,836). Hayakawa et al ('708) has been discussed above except for the selenium as the n-clad layer dopant instead of silicon. Hayakawa et al ('836) shows through their examples 1 and 2 that selenium can interchange for silicon as an n-clad layer dopant. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the selenium as the n-clad layer dopant instead of silicon, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

7. Claims 10, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa et al (4,916,708) in view of Takahashi et al (4,750,183). Hayakawa et al

('708) has been discussed above except for spacer layer (80, the part of waveguide 72) being a superlattice. Takahashi et al that a waveguide may be superlatticed for advantageously producing a high quality laser (see Takahashi's col. 1 lines 5-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hayakawa by employing a superlatticed spacer layer (80, the part of waveguide 72) as taught by Takahashi et al so as to gain the advantageous benefit of producing a high quality laser.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quyen P. Leung whose telephone number is (571)272-1943. The examiner can normally be reached on 9-5:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571)272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Application/Control Number: 09/750,504

Page 6

Art Unit: 2828

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



Quyen P. Leung  
Primary Examiner  
Art Unit 2828

QPL